REMARKS

Summary of Amendments

Claim 1 has been amended to recite limitations on the wafer-carrying substrate and the support shaft where the two components join to each other. Claims 2-4 remain in their original form.

The amendments to claim 1 find support in paragraph [0056] of the specification as filed.

Rejections under 35 U.S.C. § 103

Claims 1-4 again stand rejected as being unpatentable over U.S. Pat. No. 5,688,331 to Aruga et al., or in the alternative, over U.S. Pat. No. 6,160,244 to Ohashi.

The Aruga et al. patent is silent as to specifics of the susceptor plate and support where they are joined. In the first embodiment described, Aruga et al. simply states, in column 4, lines 38-40, "The susceptor wafer support plate 39 is mounted on the top surface of the cylindrical member 25 and is fixed to it with screws (not shown)." In the other embodiment described, the reference merely mentions that the "hollow fluted susceptor stem 120 supports and is bonded to the plate assembly 100" (column 7, lines 45-46).

The Ohashi patent, meanwhile, describes, in the embodiment of Fig. 1, joining supporting member 12 to susceptor 1A along a protruding portion 8c of a back plate 8. The protruding portion, or "projection," 8c is part of a (second) heat choke 25A. The supporting member 12 is joined to the second heat choke 25A via a second joining layer 11. In the embodiment of Fig. 5, the difference is that the protruding portion is absent from the back plate, and an annular insulating material 20 is sandwiched between two insulating layers 11. Thus the key to the support-susceptor joint system in Ohashi is the intervening insulating layer(s) 11/insulating material 20, for restricting heat from flowing into the support.

As stated in reply to the previous Office action, a particular goal of the present invention is to achieve a temperature distribution that is at least within ±1.0% in the wafer-carrying side of a wafer holder that can hold scaled-up substrates.

To achieve that goal, the present invention, as now set forth in claim 1, is directed to a wafer holder comprising a substrate having a shaft-joining side lent a planarity of 0.5 mm or less, and a surface roughness of 5 μm or less in Ra, and a

substrate-supporting shaft having a substrate-joining face lent a planarity of 0.5 mm or less, and a surface roughness of 5 μm or less in Ra. Furthermore, the support shaft is of a substance whose difference in thermal expansion coefficient with the substrate is 5×10^{-6} K or less. Then by joining the shaft to the shaft-joining side of said substrate such that a distance *a* between the center axis of said shaft and the axial center of said wafer-carrying side of said substrate is 5% or less of the diameter *L* of the wafer-carrying side, the temperature distribution in the wafer-carrying side of said substrate is within ±1.0%.

Thus the support-susceptor joint system of the present invention stands clearly in contrast to both that of the Aruga et al. patent, in the first place because of the specifics that the present invention—and claim 1—stipulate for the joint system, and that of the Ohashi patent, in the first place because of the lack, in the present invention, of intervening insulating layer(s) 11/insulating material 20.

It is respectfully submitted that the combination of either the Aruga et al. or the Ohashi teachings with the Office action assertions of the obviousness of ensuring the central axes of the support shaft and substrate are not misaligned, and of making the substrate and shaft of aluminum nitride, would not lead to the support-susceptor joint system of the present invention as now set forth in claim 1.

In making the rejections the Office action asserts that the cited prior art "teaches the same structure as that of the claimed structure," and in response to Applicant's previous arguments, that "the claimed structure is basically met by the applied art." In the former instance, the Office action further asserts that the temperature distribution achieved by a wafer holder as claimed "would be inherently met," by the prior art structure and materials.

Yet the Office action offers no factual evidence for the assertion that the temperature distribution would so be inherently met, other than to note an alleged similarity of structure and materials taught in the cited prior art. As now set forth in claim 1, the present invention clearly defines a support-susceptor joint system of a structure, nowhere disclosed or taught in the prior art, for achieving a wafer-carrying side temperature distribution of within ±1.0%—namely, a structure

> comprising a substrate having a shaft-joining side lent a planarity of 0.5 mm or less, and a surface roughness of 5 μm or less in Ra, and a substrate-supporting shaft having a substrate-joining face lent a planarity of 0.5 mm or less, and a surface roughness of 5 μm or less in Ra and being of a substance whose difference in thermal expansion coefficient with the substrate is 5×10^{-6} K or less, said shaft joined to said shaft-joining side of said substrate such that a distance *a* between the center axis of said shaft and the axial center of said wafer-carrying

side of said substrate is 5% or less of the diameter *L* of the wafer-carrying side *whereby* the temperature distribution in the wafer carrying side of said substrate is within ±1.0%.

Accordingly, Applicant courteously urges that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

July 5, 2005

James W. Judge
Registration No. 42,701

JUDGE PATENT FIRM
Rivière Shukugawa 3rd Fl.
3-1 Wakamatsu-cho
Nishinomiya-shi, Hyogo 662-0035
JAPAN

Telephone: **305-938-7119**
Voicemail/Fax: **703-997-4565**